

IN THE CLAIMS:

Please amend claims 1-20 as follows.

1. (Currently Amended) A system for providing secure mobile connectivity that implements Mobile IP Home Agent functionality via distributed components, comprising:

a mobile node belonging to a home network located within a secure network, the mobile node having a network interface configured to communicate with other nodes, the mobile node having only one security association and only one mobility binding with a home agent (HA)~~for so as to provide secure mobile connectivity that implements the a~~ mobile IPinternet protocol home agent functionality;

a proxy home agent (PHA) connected to the home network and located within the secure network, wherein the PHA proxy home agent is configured to provide a proxying functionality; ;

the HA home agent located outside of the secure network, wherein the HA home agent is configured to provide a signaling and tunneling functionality and to notify the PHA proxy home agent of the mobile node; and

a virtual private network (VPN) gateway located outside the secure network and configured to work in conjunction with the HAhome agent.

2. (Currently Amended) The system of Claim claim 1, wherein the VPN virtual private network gateway and the HA home agent are located within a single device within a demilitarized zone, (DMZ).

3. (Currently Amended) The system of Claim claim 1, further comprising a firewall coupled to the secure network and the VPN virtual private network gateway, wherein the HA home agent is located within the firewall.

4. (Currently Amended) The system of Claim claim 1, wherein the HA home agent is a separate device from the VPN virtual private network gateway.

5. (Currently Amended) The system according to claim 1, further comprising:
a demilitarized demilitarised zone (DMZ) located outside the secure network, wherein the virtual private network VPN gateway and the HA home agent reside in the DMZ demilitarized zone;

a first firewall between the secure network and the DMZ demilitarized zone; and
a second firewall between the DMZ demilitarized zone and an external network configured to deny communications from the external network with a source address in the known range; and

wherein the mobile node has a permanent address in a known range.

6. (Currently Amended) The system according to claim 1, further comprising:
a demilitarized demilitarised zone (DMZ) located outside the secure network,
wherein the VPN virtual private network gateway and the home agent reside in the
DMZ demilitarized zone; and
a first firewall between the secure network and the DMZ demilitarized zone;
wherein the mobile node has a permanent address in a known range and the first
firewall is programmed to deny all communications from the demilitarized zone DMZ
with a source address in the known range; and
wherein the VPN virtual private network gateway has a direct connection to an
internal interface of the first firewall such that the first firewall considers the VPN virtual
private network gateway transmitted data as internal to the secure network.

7. (Currently Amended) The system of Claim claim 1, further comprising:
a demilitarized demilitarised zone (DMZ) comprising a first router coupled to a
second router that is coupled to a firewall, the VPN virtual protocol network gateway
coupled to the first router, and the firewall; wherein the HA home agent is coupled to the
first router.

8. (Currently Amended) The system of Claim claim 7, wherein packets from
the mobile node destined toward nodes inside the secure network first go the HA home

agent and then to the virtual protocol network VPN-gateway that is configured to forward the packets through the firewall to the secure network.

9. (Currently Amended) The system of Claim-claim 8, wherein packets from the second router to the firewall having a source address in a known range are dropped by the firewall.

10. (Currently Amended) The system according to claim 1, wherein a router is directly connected to a firewall, and the VPN-virtual protocol network gateway and the HA-home agent are configured to connect to a different interface of the router and the firewall.

11. (Currently Amended) The system of Claim-claim 10, wherein the firewall is configured such that it considers the interface with which it connects to the VPNvirtual protocol network gateway as an internal interface and packets with a source address that are outside of a known address range received on the internal interface are dropped, and packets with a source address that are within the known address range that are received by the firewall on an external interface are dropped.

12. (Currently Amended) The system of Claim-claim 11, wherein VPNvirtual protocol network encapsulated packets are forwarded to the VPN-virtual protocol

network gateway and when a security association (SA) exists, the packet is decrypted and forwarded to the firewall on the internal interface and when a SA-security association does not exist the packet is dropped.

13. (Currently Amended) The system of Claim claim 12, wherein mobile IP internet protocol packets and VPNvirtual protocol network encapsulated packets first reach the home agent which are forwarded to the VPNvirtual protocol network gateway and then to the secure network through the firewall's internal interface.

14. (Currently Amended) The system of Claim claim 1, further comprising:
a firewall coupled to the secure network and the VPNvirtual protocol network gateway; and

a router includes comprising an access control list used to drop packets that have a source address that belong to a known address range.

15. (Currently Amended) A method, for secure communication between a mobile node associated with a home network in a secure network and a correspondent node, comprising:

establishing a proxy home agent (PHA) located within the secure network to monitor data directed to the mobile node so as to secure communication between a

mobile node associated with a home network in a secure network and a correspondent node;

establishing a home agent configured to create only one security association with the mobile node and only one mobility binding with the mobile node and to notify the proxy home agent PHA of the mobile node;

collecting data directed to the mobile node;

packaging the collected data in a virtual private network secure tunnel to an internal address of the mobile node to create VPNvirtual protocol network packaged data; and

tunneling the VPNvirtual protocol network packaged data to a current address of the mobile node.

16. (Currently Amended) The method of claim 15, wherein the VPNvirtual protocol network secure tunnel follows the IP-internet protocol security protocol.

17. (Currently Amended) The method of claim 15, wherein the tunneling of the VPN virtual protocol network packaged data to the external mobile node occurs according to the IP-internet protocol mobility protocol.

18. (Currently Amended) The method of Claim-claim 15, further comprising: packaging the collected data in an IP-in-IP tunnel and sending it to a VPNvirtual protocol

network device for virtual protocol network VPN-encryption and tunneling the VPN virtual protocol network packaged data to the current address of the mobile node.

19. (Currently Amended) A system, ~~for secure mobile connectivity that implements mobile IP home agent functionality via distributed components;~~ comprising:
- means for establishing a proxy home agent (PHA) located within a secure network to monitor data directed to a mobile node so as to secure mobile connectivity that implements mobile internet protocol home agent functionality via distributed components;
 - means for establishing a home agent configured to create only one security association with the mobile node and only one mobility binding with the mobile node and to notify the proxy home agent PHA of the mobile node;
 - means for collecting data directed to the mobile node;
 - means for packaging the collected data in a virtual private network (VPN)-secure tunnel to an internal address of the mobile node to create VPN virtual private network packaged data;
 - means for tunneling the VPN virtual private network packaged data to a current address of the mobile node;
 - means for the home agent to communicate to the PHA proxy home agent that the mobile node has moved outside its home network;

means for the home agent to communicate to the ~~PH~~proxy home agent that the mobile node has come back to its home network; and

means for enabling the ~~PH~~proxy home agent to create and remove a proxy address resolution protocol (~~ARP~~) entry for a permanent address associated with the mobile node.

20. (Currently Amended) A computer program embodied on a computer readable medium, the computer program being configured to control a processor to perform:

establishing a proxy home agent (~~PH~~) located within a secure network to monitor data directed to a mobile node;

establishing a home agent configured to create only one security association with the mobile node and only one mobility binding with the mobile node and to notify the ~~PH~~proxy home agent of the mobile node;

collecting data directed to the mobile node;

packaging the collected data in a virtual private network (~~VPN~~)-secure tunnel to an internal address of the mobile node to create ~~VPN~~virtual private network packaged data; and

tunneling the ~~VPN~~virtual private network packaged data to a current address of the mobile node.